Improving ERP Cost Estimating

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Topic	Speaker
Introduction	Mr. Wilson Rosa
Estimating Challenges	Mr. Wilson Rosa
Way Ahead	Mr. David Cashin
Lessons Learned	Mr. Noel Bishop

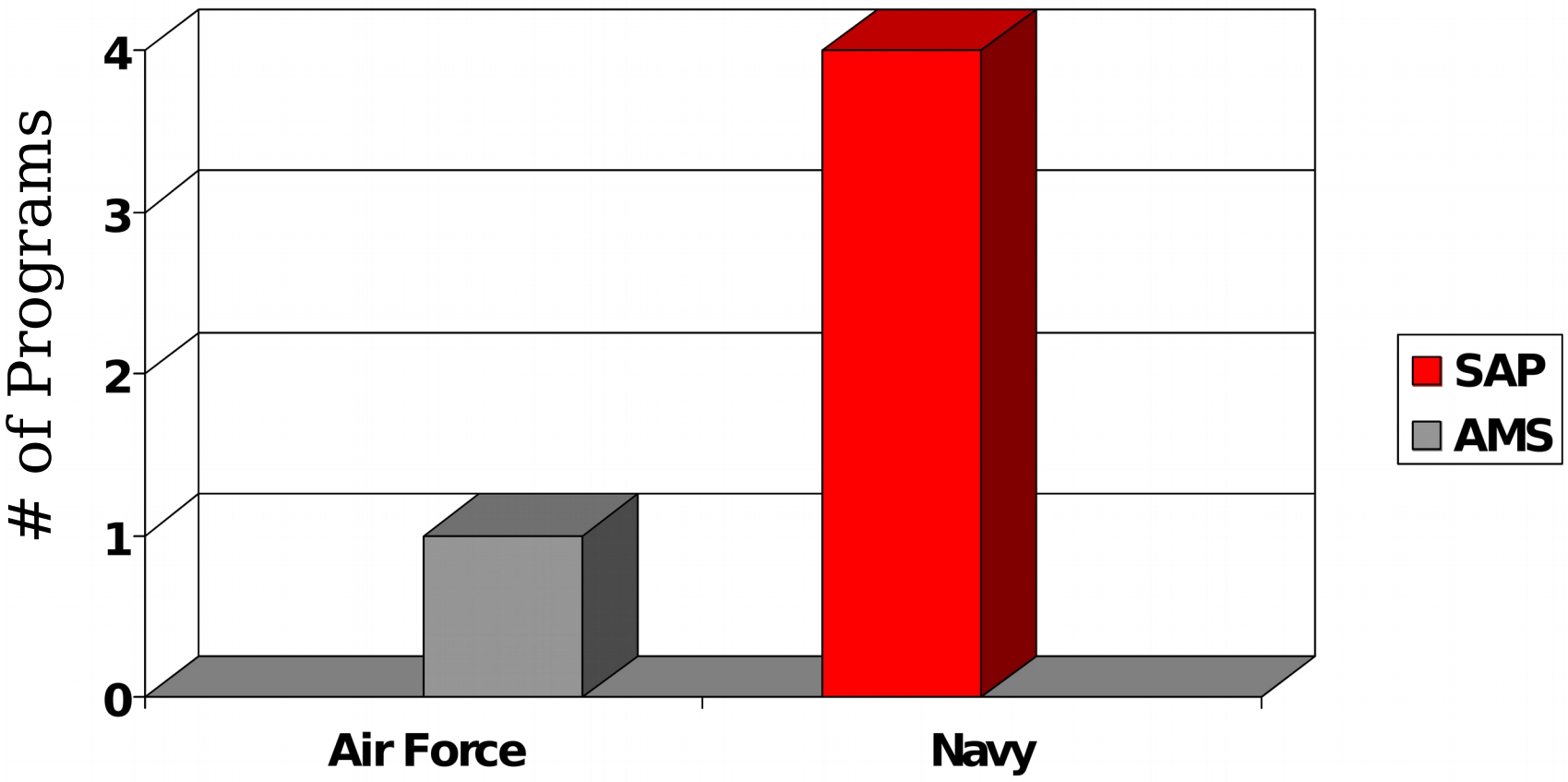
Objective

- **Share challenges and lessons learned from five recent milestone reviews**
- **Describe a plan to improve ERP cost estimating**

Introduction

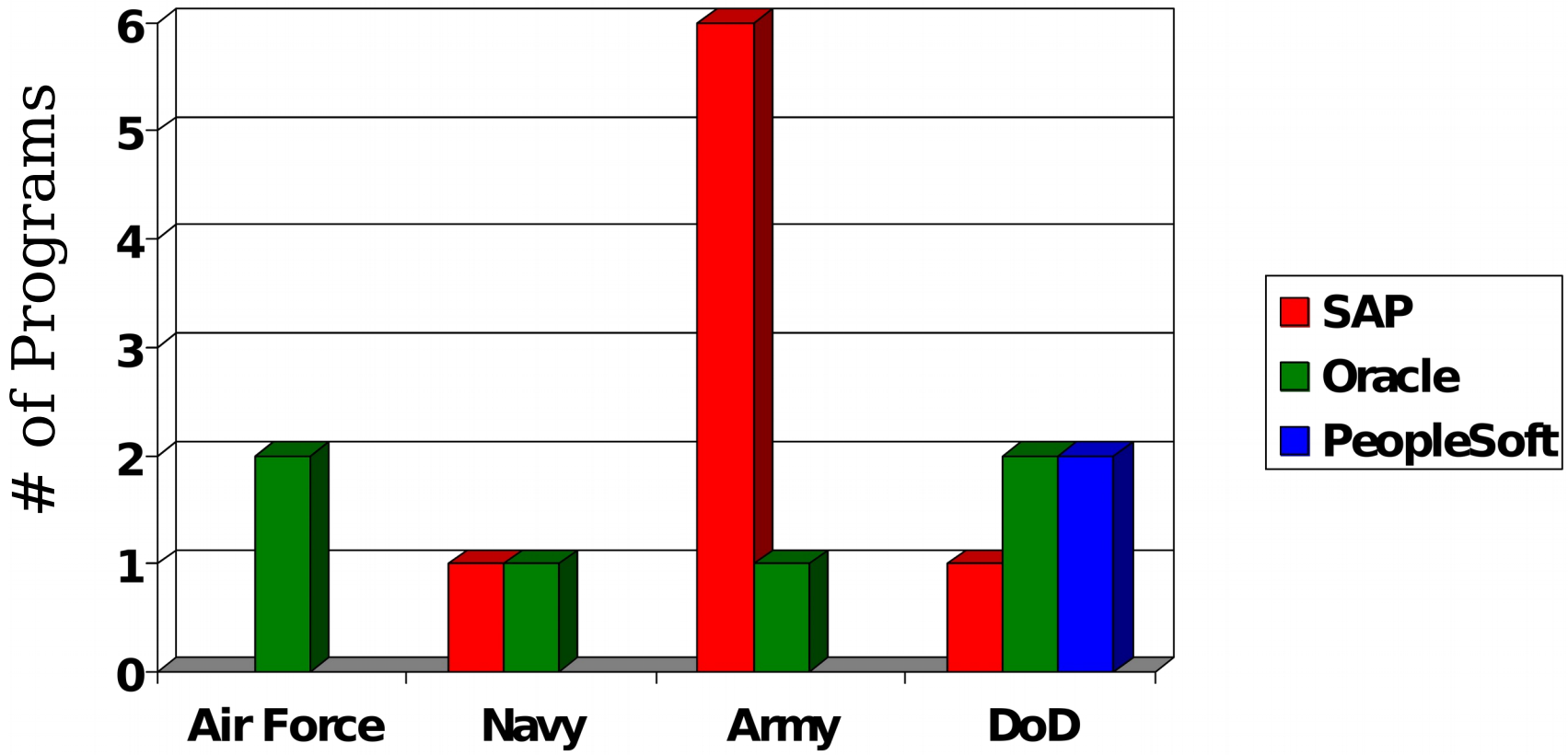
- **Procuring ERP is becoming increasingly popular within DoD**

5 Programs Deployed (2000-2005)



- Total Investment Cost ~$1.0B (TY)

17 Programs in Development (Present)



- Total Investment Cost >$6.0B (TY)

How ERP differs from Traditional Software Intensive Programs?

Factor	Traditional Software Programs	ERP
Technology	Custom-Built	Configured Commercial Off the Shelf (COTS) software
Interoperability	Standalone IT systems	Interconnected IT systems
Design Concept	System Analysis and Design	Business Process Re-engineering, Product Configuration
Primary Cost Driver	1 Parameter (Lines of Code)	Over 30 Parameters (e.g. scripts, reports, interfaces)
DoD Experience	+35 Years, Over 7,000 AIS Deployed	4 Years, 5 ERP Deployed 17 ERP In-development

Main Challenges with ERP Estimating

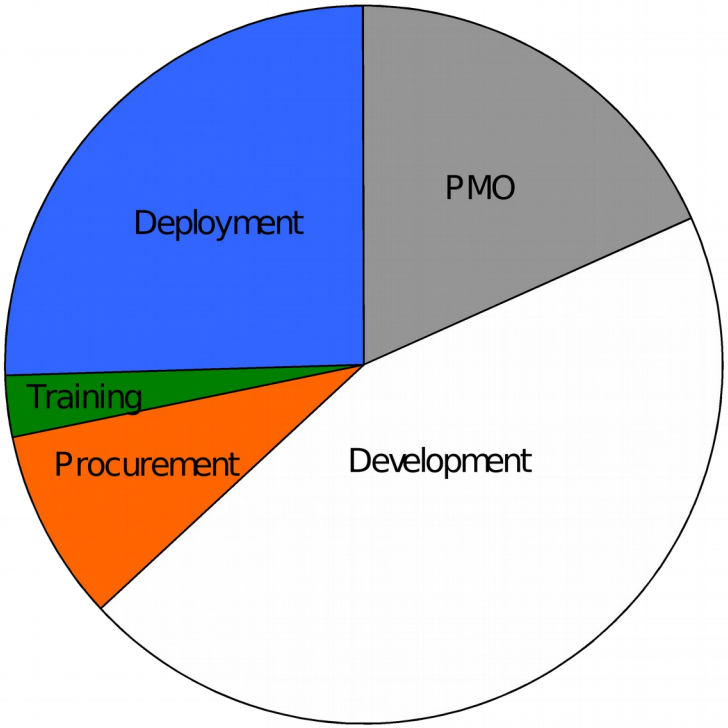
1. **Understanding Impact of Cost Drivers**
2. **Software development represents only a small fraction of total cost**
3. **No empirical research on specific ERP cost drivers**
4. **Limited historical data to support parametric tools**

Challenge # 1: Understanding Impact of Cost Drivers

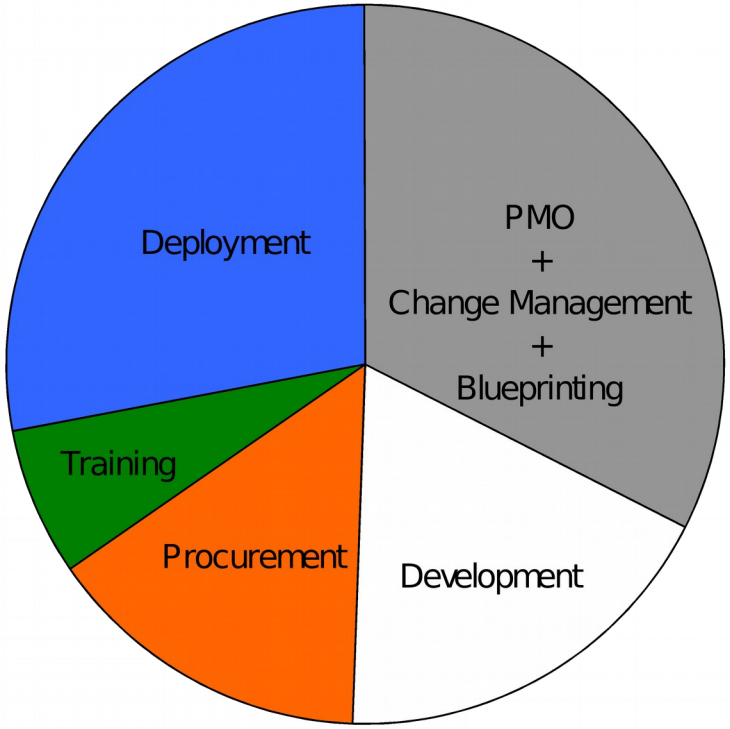
- **More than 30 cost parameters**
  - Still learning which are major cost drivers
- **Currently, analysts can quantitatively estimate only 6 out of 30**
- **Subject matter experts are unable to measure size or impact of**

  24 out of 30

Challenge # 2: Software Development is not the primary cost driver



Traditional
Software Program



ERP

Challenge # 3: No empirical research on specific ERP cost drivers

- **No journal articles or dissertations address cost drivers**
  - 0 out of 543 ERP Articles
  - 0 out of 56 ERP Dissertations
- **Few "white papers" found on cost drivers but none provide supporting data**
- **Parametric tools are just now under development**

Challenge # 4: Limited historical data to support parametric tools

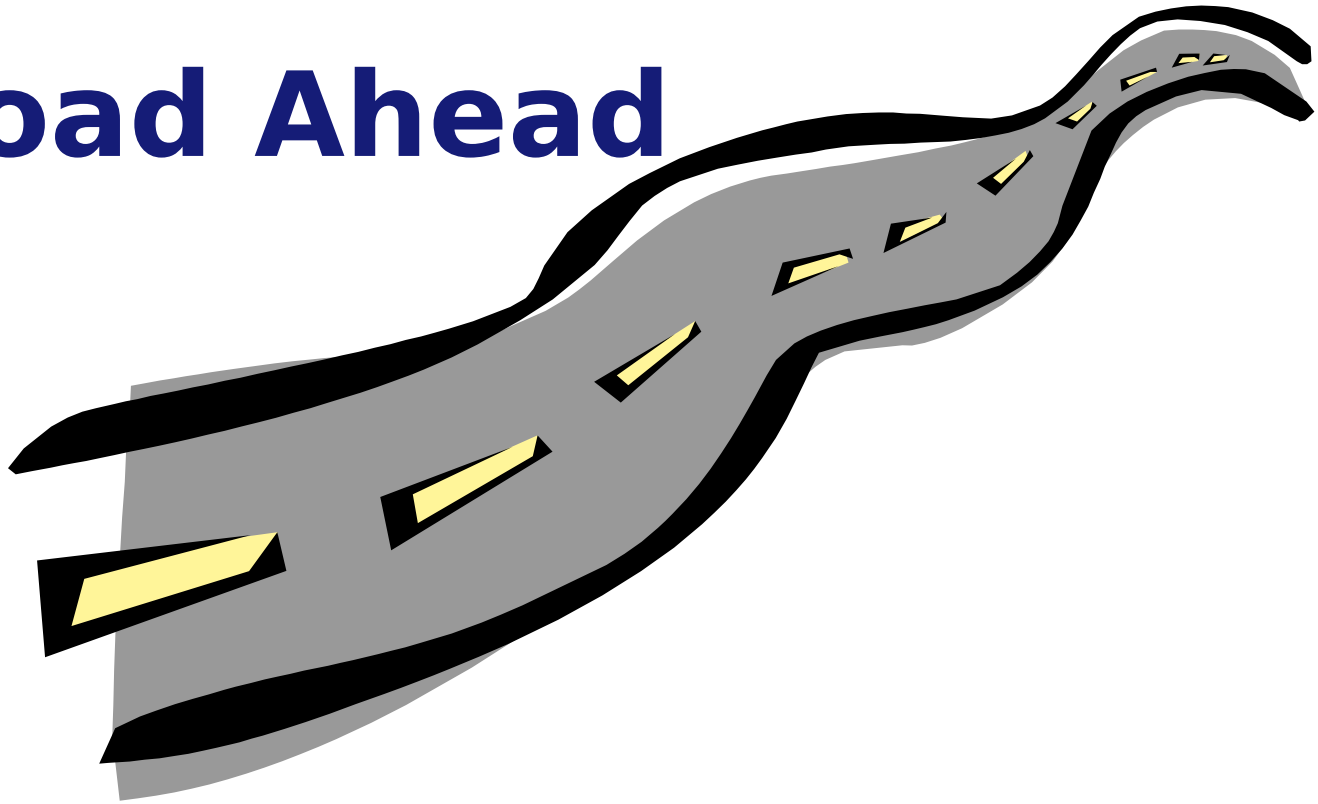
- **Five previous ERP programs**
  - Poor EVM reporting from all five
  - Cost presented at total level only
  - None reporting into DCARC
  - Inconsistent definitions/parameters
- **Enterprise Software Initiative website provides good pricing metrics but not based on actual data**

Consequence: Significant Cost Growth

Program	Cost Growth*
1	**>5%** (MS-A compared to MS-B)
2	**50%** (MS-B compared to IOC)
3	**100%** (MS-B compared to Preliminary Design Review)
4	**350%** (MS-A compared to Critical Design Review)
5	**400%** (MS-B compared to IOC)

*Preliminary data from 5 of 17 on-going efforts

Road Ahead



Identify Cost Drivers and Metrics

- **Establish methodology for utilizing size metrics**
- **Establish a single data set supporting these metrics**
- **Create standard definitions and map between various industry terms**

Data Collection Efforts

- **Ensure cost data reporting requirements are included in ERP contracts**
- **Improved CSDR and EVM reporting tailored for ERP programs**
- **Create single database across DoD:**
  - **Air Force**
  - **Navy**
  - **Army and Marine Corps**

Army, Air Force, and Navy Cost Centers are working together to build a database for AIS programs starting with ERP's

Standardize Cost Element Structures

- Survey industry to develop a single cost element structure
- Map between industry work structures and DoD CES structures
- Need to work with PA&E to amend policies/handbooks to address ERP specific guidelines

Develop new ERP parametric tools

- **Establish a foothold in new data sets**
- **Standardize language and translation guides to bridge the gap**
- **Develop analogies, metrics, and parametric tools**
- **Build rigorous approach to Risk analysis**

Lessons Learned

- **Program Office must clearly define target processes**
  - **Blueprinting and Realization schedule**
  - **RICE Objects by some level of complexity**
  - **Business Process Master Lists by some level of complexity**
  - **Legacy system integrations**
  - **Requirements, (e.g., SW licenses, hardware and satellite time)**
  - **Training and Fielding plans**

Note: ERP definitions not standardized

Lessons Learned

- **Calibrate existing models with valid data**
- **Verify CARD metrics with other official documents**
  - **Operational Requirements Document**
  - **Interface Control Document**
  - **GAP Analysis**
  - **Process Flow Diagrams**
  - **Product Assessment**
  - **C4ISR Plan**
  - **Business Process Master List**
  - **Technical and Functional Requirements**

Lessons Learned

- **Add cost growth factor to estimate based on DoD history—fact, not risk**
- **Program Office needs ERP Subject Matter Experts on hand**
- **Ensure Change Management, Data Cleansing and Normalization, and Data Warehousing are adequately addressed**

Questions?

Acronyms

AIS	Automated Information System
BSM	Business System Modernization
CES	Cost Element Structure
CARD	Cost Analysis Requirements Description
COTS	Commercial Off The Shelf
CSDR	Cost and Software Data Reporting
C4ISR	Command, Control, Communication, Computer, Intelligence, Surveillance, and Reconnaissance
DoD	Department of Defense
DCARC	Defense Cost and Resource Center
ECSS	Expeditionary Combat Support System
ERP	Enterprise Resource Planning
EVM	Earn Value Management
IOC	Initial Operational Capability

Acronyms

IT	Information Technology
MS-A	Milestone A Decision Review
MS-B	Milestone B Decision Review
OSD	Office of the Secretary of Defense
PA&E	Program Analysis & Evaluation
PMO	Program Management Office
RICE	Report, Interface, Conversion, Extension
SW	Software